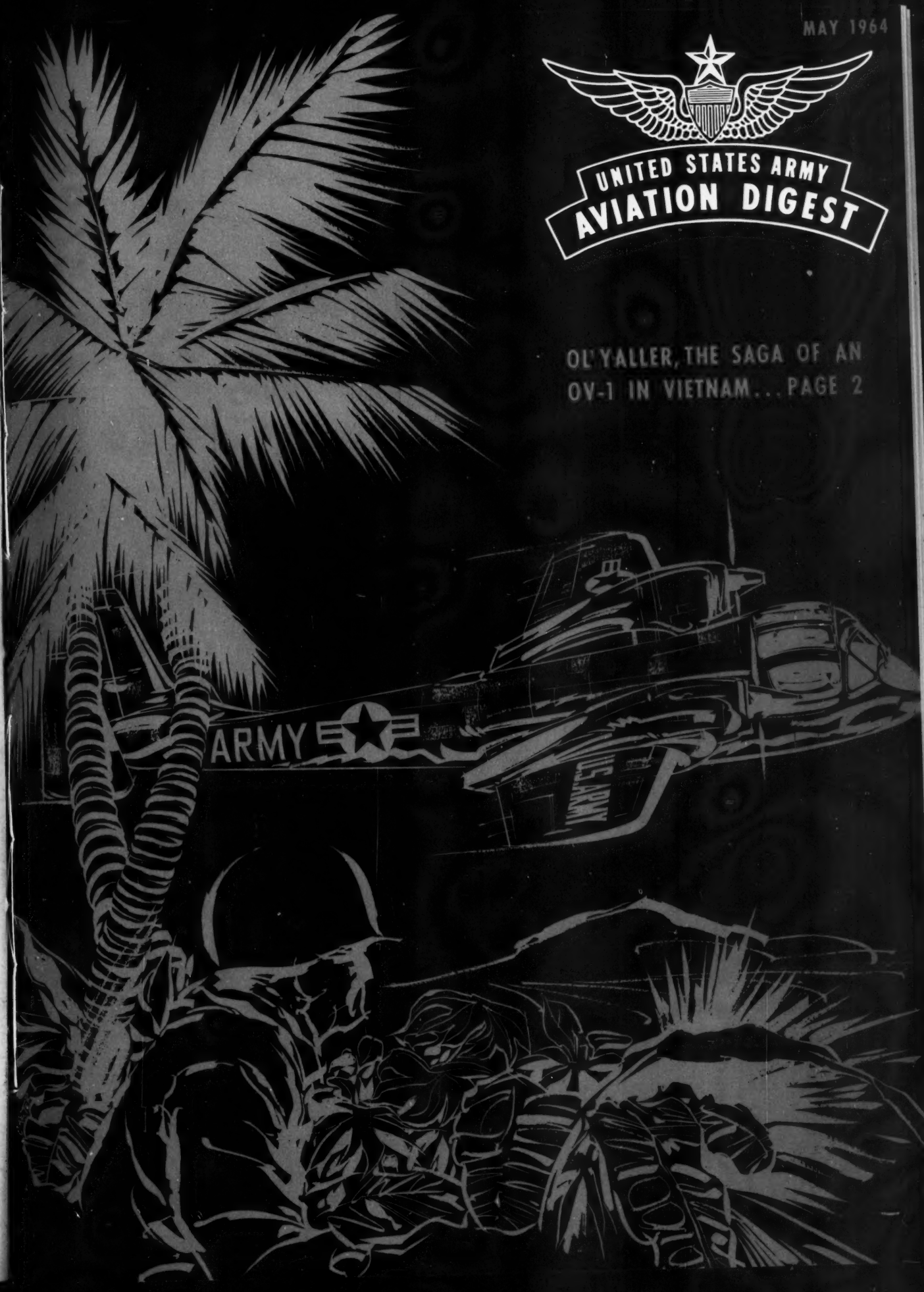
MAY 1964

UNITED STATES ARMY AVIATION DIGEST

OL' YALLER, THE SAGA OF AN OV-1 IN VIETNAM... PAGE 2



UNITED STATES ARMY AVIATION DIGEST

MAY 1964 VOLUME 10 NUMBER 5

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CONTENTS

Helicopter Instrument Flying,
Maj Gen Clifton F. von Kann 1

Ol' Yaller, Ted Kontos 2

The Primary Instructor,
Roy H. Windham and Lewis A. Pierce 7

Navigation Accuracy, Virgil Rogers 10

AFOF, Maj Virgil L. Danielson 12

I Love My Golden Voice, Maj Milton P. Cherne 17

Unit Test Pilots, CWO Joseph R. Connor 21

Standardization in Seventh Army,
Capt Robert C. Cook, Jr. 24

Crash Sense 28

How's Your DR Navigation?
Maj Ephraim A. Berry ..... Inside Back Cover

Diagnosing the Trouble, Capt Kenneth E. Cox ..... Back Cover

The mission of the U. S. ARMY AVIATION DIGEST is to provide information of an operational or functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine, and other related data.

The DIGEST is an official Department of the Army periodical published monthly under the supervision of the Commandant, U. S. Army Aviation School. Views expressed herein are not necessarily those of Department of the Army or the U. S. Army Aviation School. Photos are U. S. Army unless otherwise specified. Material may be reprinted provided credit is given to the DIGEST and to the author, unless otherwise indicated.

Articles, photos, and items of interest on Army Aviation are invited. *Direct communication is authorized to: Editor-in-Chief, U. S. Army Aviation Digest, Fort Rucker, Alabama.*

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Major General Clifton F. von Kann
Commanding General, U. S. Army Aviation Center
Commandant, U. S. Army Aviation School

Helicopter Instrument Flying

MUCH HAS BEEN said of late about helicopter instrument flying. From the training standpoint, a good deal is being done about it. Here at the U. S. Army Aviation School we are to increase the number of helicopter pilots receiving instrument training. Beginning in FY 1965, initial entry students will be given sufficient helicopter instrument instruction to receive an instrument ticket (provided, as always, that funds are made available for this additional training effort).

All this is good because it adds to the capabilities of Army Aviation to support tactical operations. On the other hand, much needs to be done to develop concepts of how these capabilities are to be translated into effective combat support and to produce the doctrine for the realization of this concept. Here, I think, much effort is needed.

Ideally, we need the capability of flying our helicopters in and out of weather. The Navy moved its carrier formations in and out of weather very effectively during World War II, and thus used weather as camouflage so that on many occasions the enemy did not know where the carriers really were. The idea of doing this with helicopters is extremely attractive; however, there are problems to be overcome.

One of these problems is the matter of flying formations under instrument conditions. Despite all that has been said, no one has developed satisfactory equipment and techniques for this type of work. Even the problem of station-keeping in actual weather has not been resolved, although it has been explored considerably by our sister services. Yet without a solution, one of the basic needs for formation flying in weather is missing.

On the other hand, I expect that we have many capabilities for marrying airborne and ground equipment to improve our capabilities for instrument flying in the field that have not yet found their way into our doctrine and literature. For example, the AN/FPN-33 radar offers considerable capability for letdown work in the field; yet, there have been only isolated experiments by enterprising aviation officers in troop units to squeeze the full utilization out of equipment systems such as these. This is unfortunate, because the best results cannot be obtained until American ingenuity is applied to our equipment. For the most part, there is so much flexibility with which aircraft and related items can be used that no one except those in the field can really wring out all the combinations. I therefore suspect that we have many latent capabilities with respect to helicopter instrument flying in the field (and fixed wing as well), that we need only listen to the fellow in the troop unit to learn a great deal.

In any event there must be some system for bringing this experience into a central location where it can be converted into doctrine. The Army has been criticized on occasion because it lacks doctrine for its aviation activities. To some extent this criticism is valid, although the operating experience to support the doctrine may exist in various locations throughout the Army.

As an initial effort to develop a body of doctrine for helicopter instrument work in the field, the U. S. ARMY AVIATION DIGEST is planning to devote an early issue to articles (or any other submissions received) on helicopter instrument flying, particularly in tactical situations. I am hoping that everyone in the field who has some knowledge or experience along this line will make a contribution, even if he has some doubt as to how worthwhile the material may be. Let us be the judge of that; but in any event send it in.

Because of the importance of this subject, I plan to present a special cash award of $100 for the article selected as the best one for this particular issue. I doubt that the monetary incentive will be needed, but perhaps the prize will serve to indicate the importance which I attach to the subject.

Your article should be submitted no later than 1 August 1964 to U. S. ARMY AVIATION DIGEST, USAAVNS, Fort Rucker, Ala.

the saga of an OV-1 operating in the Republic of Vietnam

OL' YALLER

— Chief of the Mohawks

Ted Kontos

AMONG THE MOHAWKS in the Army inventory, one has become almost a legend because of its exploits over the rice paddies and jungles of Vietnam. It was named by the crews who flew it, the mechanics who kept it going, and the ground crew troops it supported.

Don't get the idea its name was a reflection on its intestinal fortitude. It was just the opposite; Ol' Yaller's name came from the many patches of yellow primer used to cover battle scars. It was a proud name and a proud aircraft.

Like all Mohawks, Ol' Yaller was not designed to challenge the speed of sound or conquer outer space. It was friend and helper to the foot soldier, possessing those skills necessary to support troops in the field.

Ol' Yaller rolled off the assembly line right into the Army. Like all soldiers, it was given a thorough physical, assigned a serial number, and sent through basic training. While maintenance crews poked and probed to become familiar with its anatomy, flight crews strove for proficiency. Through it all, the young Mohawk appeared to enjoy every minute.

When it became bored with training, Ol' Yaller could always devise ways to liven things up, like clearing its throat at a critical point during a maximum performance takeoff. This never failed to prove a sure-fire attention getter from its crew.

Nor did it forget the mechanics. If it lacked attention, it wasn't beneath Ol' Yaller's dignity to resort to a bit of gold-bricking. A fire warning light might come on when there was no fire, or an internal hydraulic leak might suddenly develop in some remote spot. These antics kept the ground crews on their toes and served to teach good troubleshooting and maintenance practices.

Parked on a ramp, Ol' Yaller was an impressive sight. From its proud nose and wide plexiglas eyes, its barrel-chested fuselage tapered smoothly back to a triple tail. Squatting on its tricycle gear it pointed skyward. Off the ground, it frolicked like a playful seal, climbing, turning, rolling (at a respectable altitude), and diving. If another Mohawk did a series of three loops, Ol' Yaller went for four. Its climbs were steeper and its banks tighter. It was a delightful show-off — a big ham.

Ol' Yaller had its stubborn moments, too. If it wasn't ready to land, it sometimes took a notion not to extend its gear, testing a new pilot to see if he knew his emergency procedures. It landed proudly with its nose in the air, letting everyone know it was back by a thunderous roar in reverse pitch.

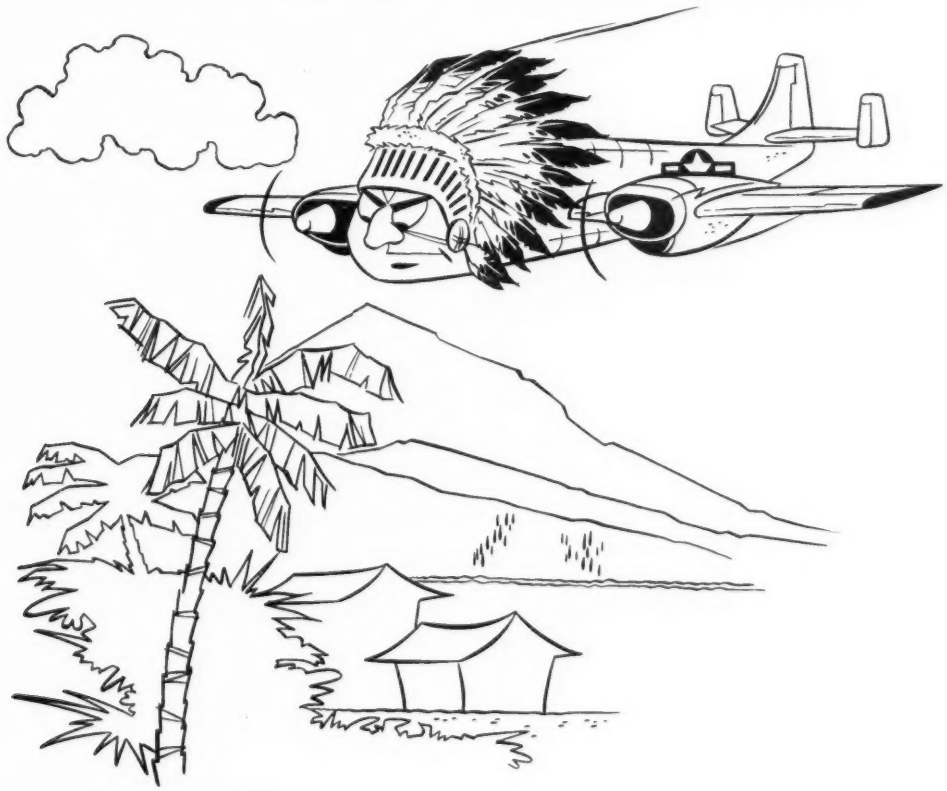
As the days drifted into weeks, and the weeks into months, Ol' Yaller matured. Its crews, both ground and flight, became highly skilled. Gold-bricking was a thing of the past and flying was no longer just a sport. It had become a full-time occupation.

When the Mohawks were called to Vietnam, Ol' Yaller was among the first to go. From the instant its wheels touched the ground in the Republic of Vietnam, Ol' Yaller seemed to sense that this would be a different kind of world from the one it had known. The people around it had an air of urgency.

Designated a Hawk, Ol' Yaller was pressed into service immediately. Its job was to search out the Viet Cong and report their position. With a Vietnamese observer aboard, it soon lifted off on its first mission.

Flying at 200 feet and 130 knots, Ol' Yaller passed over rice paddies and jungle thickets. The observer pointed ahead and to the right toward a thicket on a slight rise. Ol' Yaller banked quickly to the right and met a hail of bullets. Pointing its nose skyward, it climbed out of range and the find was radioed to friendly troops.

Its fuselage stitched with bullet holes, Ol' Yaller survived this baptism of fire and returned to its base. Ground crews patched the holes, but there was not time for a beauty treatment. Painting would have to wait. Communist guerrillas had burned and sacked an isolated village. Ol' Yaller was needed to help support the Vietnamese



rangers who were in the objective area on a helicopter assault mission. With its patches riveted in place and a coating of yellow zinc chromate dabbed over them, Ol' Yaller was ready for takeoff. This time it carried some retaliation under its wings.

Flying low and slow, it made pass after pass over the general area in which the Viet Cong were thought to be. Suddenly, it felt the sting of bullets for the second time. But this time it had the means to do something about it. Like a giant hawk, Ol' Yaller swooped down on its prey. Its rockets were salvoed and ribbons of smoke trailed them to the mark.

It was a proud Mohawk and equally proud crew that returned that day. But there was no time for celebration — only time for the yellow patches that marked another Purple Heart for Ol' Yaller. In the months that followed, this became almost routine in the support of helicopter formations — scouting, searching, supporting, destroying. And always there were more and more yellow scars. Its combat time climbed into the hundreds of hours and the yellow scars almost covered its body, but Ol' Yaller never let up. When a job called for a Hawk, it was always available and ready.

Practically everyone in Vietnam recognized Ol' Yaller and knew of its exploits. The ground troops stationed forward in the lines would radio the crew when they spotted it, "How's Ol' Yaller?" or "How's the chief?"

One clear morning Ol' Yaller fired up for a surveillance mission with another Mohawk. At a word from the control tower it began its takeoff roll. Twenty-four Purple Hearts and more than 900 hours of combat were behind it as its wheels broke the ground. A short time later, it dived downward, decreased speed, and began to stalk its quarry.

With the other Mohawk to its left, Ol' Yaller followed a river through jungle terrain. Ahead and below, Viet Cong eyes watched its approach through the sights of their guns.

Nearer and nearer Ol' Yaller came. Then the jungle stillness was shattered by the drumming of automatic weapons and the sharp crack of rifles. Ol' Yaller was hit and hit hard. Its pilot banked toward home, nursing the crippled chief along.

As they approached the strip, the pilot tried to determine the extent of Ol' Yaller's injuries. Both

engines were operating in the green, but the hydraulic pressure was gone. Without it Ol' Yaller would be reluctant to drop its gear, but the emergency air system appeared to be intact and could be used to get the gear down. The pilot told the control tower about his problem, then went through the emergency gear extension procedure. Two wheels showed down and locked, but the right main gear remained up. Bullets had apparently torn into the gear components and air pressure wouldn't put it down. It was a freakish kind of accident, against all odds. But it had happened. Worst of all, it had happened to Ol' Yaller.

Again the pilot spoke with the control tower. He told them he would climb and attempt to shake the gear down with high positive g forces. But even as he applied power and raised the nose, he knew the chances of getting the wheel down were small. Unless the locking mechanism had been damaged enough to give under pressure, the wheel would stay up.

Ground personnel began to gather in little groups. They watched as Ol' Yaller climbed, then dived to gain airspeed. It climbed and dived — up, down, up, down. Time and again the pilot tried, violently rocking the wings back and forth. Ol' Yaller was fighting for its life. But it was a losing battle. It had been mortally wounded.

In desperation, the pilot descended and flew Ol' Yaller to the runway, slamming it hard on the two extended wheels in hopes of jarring the stuck gear down. But it just wouldn't work. Without hydraulic pressure, he could not retract the two wheels that were down, and to attempt a landing in that configuration would have been to court disaster. He had to eject.

Climbing to 5,500 feet, the pilot pointed Ol' Yaller out toward the sea and trimmed it to fly hands off. Instructing the observer to eject, the pilot watched him pull the face curtain and shoot upward. He watched behind, saw the observer's chute blossom, then drew a deep breath and prepared to eject himself. He reached for the face curtain and quickly yanked it downward. With a thunderous cough, Ol' Yaller spat him to safety.

Down below, Vietnamese and American personnel watched as the pilot's chute opened and the crippled Mohawk headed out to sea.

But Ol' Yaller wasn't ready to go. It belonged

to the Army, and there would be no sailor's grave for it. Almost as though it had a mind of its own, Ol' Yaller dipped a wing, made a 180° turn and dived straight for the pilot dangling beneath his chute.

Had Ol' Yaller turned renegade like a crippled beast? This thought raced through the minds of those on the ground. And all the while, Ol' Yaller sped toward the helplessly suspended pilot. Then, just as suddenly as it had started its pass, Ol' Yaller abruptly veered away.

Unmanned, its proud yellow scars shining in the sun, Ol' Yaller began a performance that left its viewers breathless. Diving, climbing, twisting, and turning, it raced across the sky in a triumphant show. "I am still chief!" it seemed to say. And no one doubted that it was.

From its high vantage point, one chore remained for Ol' Yaller, that of picking out its final resting place. Like a true chief, it selected the most appropriate spot — the salvage yard. No ground crews would have to wade through marsh or jungle to haul away its remains. It would need no pall bearers.

Lifting its head in a final fling, it flipped over and dived into a small clear area between the wreckage of other aircraft, cremating itself in a column of flame and smoke.

Ol' Yaller was gone.

NOTE: Despite a sprinkling of imagination to fill in the gaps and some deletions to ensure anonymity, many readers will recognize Ol' Yaller. This is the true story of an OV-1, given to us by an officer who knew it well.

Roy H. Windham
Lewis A. Pierce

What makes a good flight instructor? Are experience and flight proficiency enough? Are today's professional contract instructors better than ever?

the primary instructor

WHEN YOU THINK about your primary instructor, does the memory bring on a warm glow of nostalgia or does the mere thought cause you to break out in a rash? If you fall in the "rash" category, chances are you would notice a real change in the present primary program.

This first step in the training of Army Aviators at Fort Rucker is the responsibility of over 150 instructors and supervisors employed by Ross Aviation, Inc., civilian contractor of Army Primary Fixed Wing Training.

The civilian instructor is a professional flight instructor by choice — a man who has devoted 10 to 15 years of his career to teaching flying, the majority of it in military training programs. Of him, the general manager of Ross Aviation training at Fort Rucker, says: "The responsibilities of our flight instructors are heavy. They must have a complete knowledge of the subject, a high degree of proficiency, an understanding of the problems confronting the student, and the ability to teach the knowledge and skills required so that precision flying becomes automatic to the student. Their instruction must adhere rigidly to the best standards, procedures, and techniques."

TEACHING TECHNIQUES

Instructors assign each student a lesson to be mastered in advance of each flight and then make certain that their instruction parallels that material. To ensure systematic progress and com-

Mr. Windham is Director of Fire and Safety and Mr. Pierce is MOI Supervisor with Ross Aviation, Inc., at Ft Rucker, Ala.

The primary fixed wing check pilot is a highly qualified and standardized instructor pilot

plete mastery of the basic fundamentals, they present the course lesson by lesson, with the student learning each lesson thoroughly before advancing to the next. It should not be assumed, however, that an inflexible sequence of presentation must be followed. On the contrary the policies governing teaching technique allow and encourage special approaches and tricks of the trade to put the material across. Sound judgment, of course, is exercised in meeting and solving problems as they arise.

Although the individual instructor pilot is allowed wide latitude in the methods he uses to teach his students, no variation is allowed in the methods of performing the actual training maneuvers. Each instructor completes an extensive and comprehensive upgrading and Methods of Instruction course before assignment of students. During this course he is shown exactly how the Army wants the training maneuvers performed. When the potential instructor can explain and demonstrate the maneuvers to suit the MOI supervisor, he is given an acceptance check by the Military Standards Division of the Primary Fixed Wing Training Department. To pass this check, he must demonstrate exemplary flying proficiency and teaching technique. Only after passing this check is he assigned his first student.

STANDARDIZATION

Each student is expected to perform the same maneuvers in the same way and use the same procedures during checkrides. Standardization is not maintained by conducting recurring checks on the instructors. On the contrary, as long as an instructor's students are fulfilling required standards of performance on their checkrides, the instructor is not given a standardization check. An extremely accurate and current accounting of each instructor's effectiveness is maintained by the Military Standards Division from information collated from student progress checks.

Those instructors having more student errors than a predetermined standard for a given maneuver are counseled concerning the maneuver in question. If the counseling does not stop his students' errors, the instructor is given an assistance ride on the maneuver in question.

An obvious shortcoming of any flight proficiency evaluation system is the human factor involved in evaluating student performance. Since more than one check pilot evaluates student progress, it is reasonable to expect that several different conceptions might be evidenced in the writeups and scoring of individual maneuvers. To overcome this, a record is kept of all low grades a check pilot gives on each training maneuver. Whenever the number of low grades given by a check pilot on any maneuver exceeds a predetermined maximum, he is counseled by the Military Standardization supervisor concerning that maneuver. This counseling usually results in correcting any misconceptions the check pilot might have regarding desired standards of performance. If it does not, he is given further counseling and flight instruction until his reliability is restored.

MONITORING

The continual monitoring of the overall effectiveness and standardization of both instructors and check pilots, through the recording and computing of student performance criteria, has resulted in a remarkable degree of standardization in the Primary Fixed Wing Training program. Student morale concerning the standardization of

their training and evaluation of their flying proficiency is very high. The end result has allowed each instructor pilot and check pilot to concentrate on helping each other to provide the Army with aviators well trained in the fundamentals of flying.

MILITARY CHECK PILOTS

There's been a change in military check pilots, too. Today he is a far cry from the old villian lurking in the background. Through the process of thorough upgrading and close supervision by competent personnel in the Military Standardization Division, today's primary fixed wing check pilot is a highly qualified and standardized instructor pilot as well as a check pilot. When conducting a checkride, the check pilot works just as hard to find reasons for continuing a student's training as he does to find reasons for eliminating him. Approximately 25 percent of all students considered for elimination because of inability to solo have been soloed by military check pilots. The great majority of these students finish primary and B phase of training without further incident.

Before you jump to the conclusion that we have lowered our standards, let me point out that although our elimination rate is lower than ever before, our accident rate is also lower. It is our goal to hold the elimination rate *and* the accident rate down to the minimum through good training procedures. We attempt to make good military pilots out of *all* students entering training, provided they are willing to put out the effort required.

FLYING SAFETY

Another area in which a great improvement has been made is flying safety. Although we still have accidents in primary, their frequency and severity are steadily decreasing. The improvement in our flying safety records is, of course, due to many factors. We believe that a low accident record is not an end in itself but is simply the by-product of good training and efficient operation. The company achieves its excellent safety record first of all by hiring only the best instructors available, and then by providing these instructors with the best and most efficient supervision and support possible.

One thing you would not see today is the long, drawn out, or boring type of flying safety briefing. It is the management's philosophy that accident prevention is primarily the responsibility of the individual flight instructor. Under this concept, each instructor integrates continuous on-the-job safety and accident prevention consciousness in all the instruction he gives to his student. We believe that a well trained pilot is a safe pilot and that the primary responsibility for training students and turning out safe pilots rests with the instructor.

EFFECTIVENESS

Our instructors constantly strive to be conscientious, objective, and impersonal in evaluating their students' performance. They maintain a fair, firm, and friendly policy at all times.

Our instructors have earned the respect and admiration of their students by using good explanation and perfect demonstration techniques. They realize and practice the concept that their job is to equip the United States Army student aviator with a background that will enable him to successfully complete Advanced Fixed Wing Training.

To our instructors, flight training is more than just a job or a responsibility. They know full well that they are obligated to see that their students are thoroughly sound in the techniques of flight and that they possess a healthy attitude toward their careers as Army Aviators and confidence and respect for themselves, their equipment, and their teammates.

Here is a short quiz used by primary instructors to evaluate their own effectiveness:

Do I have a planned, progressive program of instruction?

Do I create a learning atmosphere?

Do I get the most out of each student?

Do I adapt my teaching techniques to the individual or do I just throw out the same "stuff" to each student?

Am I more effective now than in the past? If not, why?

Am I a "lamb" on the ground and a "lion" in the air?

Do I know what to expect from a student at a given time level?

Do my students know how they stand?

Do I integrate the maximum amount of flying safety consciousness in all my flight instruction?

Am I giving the job all I've got?

Where are you?
Where do you want to go?
How do you want to get there?

A self-contained navigation system will determine accurate positions on future flights.

Navigation Accuracy

Today and Tomorrow

Virgil Rogers

IN THE NEXT few years, the Army will probably install self-contained navigation equipment in some of its aircraft. This equipment will require certain information to perform its intended function. In general this information will consist of the following:

Where are you? (present position)

Where do you want to go? (destination)

How do you want to get there? (intermediate destinations)

In addition, this device will require initial (or continuous) direction reference with respect to the map system you are using.

This self-contained device will then perform the necessary calculations to determine your position at any time, using velocity data from the aircraft's movement. If this device is constructed with adequate care, it may have an accuracy of approximately 1 percent of the distance flown, or some fixed error distance determined by the mechanical or electrical circuits of the device and by the aircraft flight time.

Navigation in the Army is an approximate art that has proved satisfactory because it was not possible to obtain precise results. If an aviator wants to make a flight from Fort Rucker to Atlanta, he selects an aircraft having a certain range and speed capacibilty. He then determines his route of flight from available publications, checks weather and wind conditions, and prepares a flight plan. If the aircraft (in this case a U-6), weather, and other circumstances cooperate, the aviator will arrive in the Atlanta area in approximately 1 hour and 25 minutes after takeoff. He then locates the airfield by visual reference or the use of established radio aids, and lands. Some time later he may comment to his friends, "I sure hit my ETA on the head today, only off 10 seconds over the VOR."

One has to admire this man's skill (luck?), because we all remember the time we missed this same flight ETA by 15 minutes. *Of course* this was caused by faulty wind information received at the weather briefing. But still that wasn't too bad, since no one gets upset very much until we are an hour overdue.

In the above example the pilot flew an aircraft at approximately 110 knots (107-114 mph) in a wind of 15 knots (18.7 with gusts to 21.8 mph) from 300° (281-305) for a distance of 150 nautical miles (148.3) and arrived over a selected target within 10 seconds of the *estimated* time. If this pilot had no visual target other than a group of similar fields and no groundbased radio aids at the destination, which field is his destination? In this example, he would be within 1/3 mile of the selected target, but what about the case where the luck (?) went the other way and he missed by 15 minutes? Then he would be approximately 30 miles from the target at the end of his *estimated* flying time.

If you were given a self-contained navigation device today, you would probably be disappointed until you learn how to use it. You will expect to arrive at your destination with an accuracy of 1 percent. But this will not be the case. Using current maps, charts, and equipment, you cannot determine precise information to feed your SCAN device. Few people have access to equipment or information that will tell them to within an accuracy of 1° the direction of Magnetic North, Grid North, True North, or any other reference direction. And remember, 1° of heading error equals (approximately) 1 mile position error every 60 miles of flight. People do not know the exact distance in miles, nautical miles, kilometers, or even latitude and longitude between their airfield and any other airfield they frequently use.

With this lack of precise information, even a perfect device will produce navigational errors. Since navigation computers and sensing equipment are not perfect devices, we can expect some error even with perfect information.

Any self-contained navigation system which may be introduced into the Army will not provide a positive indication that you are exactly over your girl friend's house after flying two hours in the clouds. But these devices will provide an improved chance of being able to see her house on the first low pass and will ensure that you are at least over the proper town. Could you be sure of doing that well now without dual omni, ADF, and many dollars worth of groundbased navigational stations?

When you get the black box give it a fair chance to prove its value to you. Be sure you give it the correct information. Its answers are based on flight data which has been applied to information *you* provided.

A former Army Aviator, Mr. Rogers is an electronic engineer with the U. S. Army Aviation Test Board, Ft Rucker, Ala.

The Army Flight Operations Facility in Germany is providing an important, safe, and expeditious service that helps Seventh Army Aviation units accomplish their mission. Would such a facility help your operation?

AFOF

[*Army Flight Operations Facility*]

Major Virgil L. Danielson

SEVERAL YEARS ago an organization called the 5th Aviation Operating Detachment was formed to supervise and effect control over many Army airfields used by the United States Army in Germany. This consisted of operation of the control towers, air traffic control responsibilities around those Army airfields, and the operation and maintenance of the navigational facilities serving these airfields.

Due to the build-up of Army Aviation in Germany and the additional number of airfields in use, decentralization of control became necessary to cope with the situation. The Aviation Operating Detachment (AOD) was dissolved and control of the Army airfields was turned over to the major unit occupying those airfields. A flight following function of the AOD, which was formed to assist aviation unit commanders in knowing the whereabouts of their aircraft flying in Germany, was retained. This became the nucleus of the Army Flight Operations Facility, better known throughout Europe and Germany as AFOF.

The Army Flight Operations Facility, AFOF, was formed as a TD unit under Signal Corps manning tables as a part of the Signal Service Battalion, Europe. The facility is located on the Army airfield in Heidelberg. From a rather austere beginning this organization has developed into an agency that literally has its finger on the pulse of Army Aviation throughout Germany and, in many cases, throughout Europe. It is possible for Army Aviators to contact AFOF on direct lines from the majority of the Army airfields in Germany to file a flight plan or to secure weather information for flight planning.

Maj Danielson is Chief, Primary Maintenance Division, Dept of Maintenance, USAAVNS.

The facility is designed to function around four separate but related activities: a Clearance and Weather Section, a Traffic Section, a Flight Following Section, and a Teletype and NOTAMs Section.

CLEARANCE AND WEATHER SECTION

This section serves as the nerve center of the facility. From it other groups are directed, under the supervision of the officer on duty. A duty officer (referred to as clearance officer) is at the Clearance Section 24 hours a day, 7 days a week. In

I WILL CATCH H.... FROM THE AFOF CLEARANCE OFFICER FOR OVER STAYING MY GROUND TIME FOR YOU TO HAVE THAT LAST GLASS OF BAVARIAN BEE.

all cases he is a rated pilot currently on flight status with a current instrument card.

Until recently this officer was the clearance authority for the majority of aviators flying from Army airfields in Germany. In recent months, due to changes in current regulations and the fact that many Army Aviators now possess their own clearance authority or because clearance authority is available at local operations offices, this function has diminished. In some instances though, airfields have vested in AFOF the clearance authority for aviators flying from various airfields for certain types of flights and under certain conditions.

In addition to functioning as a clearance authority, the clearance officer coordinates search and rescue missions for the commanding officer of the facility, who has the overall responsibility of search and rescue in a defined area of operations.

He also assists aviators in flight planning when requested. The Clearance Section has access to most of the flight planning documents that are in use in Europe. From these documents much information can be passed to aviators who do not have access to a complete set of aeronautical publications.

The clearance officer is kept abreast of all the current weather information in AFOF areas of responsibilities by an Air Force weather forecaster who sits next to him. If weather conditions indicate a situation that could affect the outcome of a flight in progress, the clearance officer will issue weather advisories to aviators in flight. Other types of advisories are also initiated from the clearance section.

Flight plan acknowledgements may also be called into the clearance section, and at the same time the pilot may get a weather briefing from the forecaster on duty. This minimizes the delay that a pilot would encounter if he were filing a flight plan from an airfield without an active base operations and assures the aviator that his flight plan will get into the system after his departure.

TRAFFIC SECTION

This facility has the most activity within the organization. All proposed flight plans are routed through or come directly to this section. Most of the Army airfields have direct lines to the facility through the main Army switchboard in Heidelberg. Those not having direct voice lines to the Heidelberg switchboard may contact AFOF through the regular telephone trunk circuits on a priority basis. The Traffic Section has ten positions that can be used for typing flight plans received from either the Army airfields operations or from other flight service activities to which they are connected by voice circuits.

Flight plans are called into the facility in a standard format, which is furnished to all users of the system. Upon receipt of the proposed flight plan, it is identified by position number where copied, date and time received, initials of persons copying the flight plan, and initials of person transmitting the flight plan. All conversations over the direct voice circuits coming into AFOF are recorded on tape, with a separate channel for each position within the facility, making it possible to review any conversation.

As proposed flight plans and actual flight plans are received in the traffic section, they are passed to a person designated as a router. The router checks each flight plan for completeness of information and obvious errors, and acts as a coordinator between the Traffic Section and the rest of the facility. When actual off times are received on proposed flight plans, he records this information on the flight plan and then directs it to the Flight Following Section of the facility for posting on the flight following board.

FLIGHT FOLLOWING SECTION

This section ultimately receives all flight plans that come into the facility from any source. Incoming flight plans are directed to either the fixed wing or the rotary wing section of Flight Following. They are checked again for completeness of information and obvious discrepancies before being placed on the flight following board.

Exacting flight following procedures enable this section to immediately determine the whereabouts of a flight at any particular time. All flight plans are filed on a viewing board in numerical order by the last two digits of the aircraft tail number. Separate sections are used for aircraft flying into or within the Air Defense Identification Zone, VIP-carrying aircraft and medical evacuation aircraft, and for flights of a routine nature. Aircraft flying into or within the ADIZ are flight followed on a 15-minute base. (This is to say, if an ADIZ flight is 15 minutes overdue at a destination, a communications search is initiated.) VIP and medical evacuation flights are flight followed on a 30-minute base, and for all other flights the normal 1-hour base is used.

If an aircraft is making intermediate stops before reaching its final destination, these stops must be included on the flight plan along with estimated time between stops and time spent on the ground. Gas expiration time is included on all flight plans filed with AFOF and this is monitored very closely by flight following personnel. After termination of the flight, the flight plan is removed from the board, properly identified by initials of person closing and time of closure, and filed by tail number along with all information relative to the flight.

TELETYPE AND NOTAMS SECTION

This section receives flight plans by teletype from International Civil Aeronautical Organization (ICAO) airfields and foreign military airfields and relays flight plans to these two agencies. In addition to flight plans this section also receives and transmits NOTAMs over these teletype circuits.

NOTAMs are received from ICAO agencies, foreign military agencies and from the Air Force NOTAM Center of the Air Force Flight Service activity. These NOTAMs are edited and filed for use within AFOF, and copies are sent to the Army Flight Information Detachment, which has the overall responsibility for editing and disseminating NOTAMs for the Army in Germany and other parts of Europe.

Other functions of the NOTAMs Section include securing PPOs (Prior Permission Only) for the use of restricted airspace and facilities throughout Europe, assistance in securing diplomatic clearances for Army aircraft flights when requested, coordinating search and rescue missions, and handling of advisories between AFOF, ICAO and foreign military agencies.

The Army Flight Operations Facility is considered one of the most active flight service activities in the entire world, by total volume of DD 175 flight plans handled. For the past few years an average of 150,000 flight plans a year have been processed. The use of the facility is open to anyone requesting the services available. Many flight plans each year are processed for civil, foreign military, and members of the other United States forces.

AFOF's areas of responsibility include all Army airfields in Germany, all civilian and foreign military airfields in Germany, non-USAF airfields in the Benelux countries and Denmark, and certain non-USAF airfields in France. To accomplish this vast mission the facility is linked by voice circuits to the Air Force Flight Service activities in Germany and France, and through these two links access can be gained to Air Force Flight Serv-

ice stations in England, Spain and Italy. Voice circuits tie the facility to all the civil air traffic control agencies in Germany for coordinating instrument flight plans filed with AFOF. Then of course there are all the means of communications mentioned earlier, such as the teletype lines to enter the ICAO network, the teletype lines to the German Military Flight Service, and the numerous direct voice circuits to the Army airfields in Germany.

The support given by the Air Force Weather Service cannot go unmentioned. At the facility in Heidelberg an Air Force weather detachment handles the in-station weather briefings for all aviators flying from that airfield. In addition to the forecaster on duty with the clearance officer, other forecasters are available for telephonic briefing to any aviator in the field who has access to the communications systems of AFOF.

Air Force weather detachments located at Army airfields in Hanau, Germany, and at Stuttgart, Germany, provide essentially the same service supplied by the detachment in Heidelberg. An aviator in the field desiring weather information need only contact the main Army switchboard at Heidelberg for weather information.

A new weather detachment just recently added at the Army airfield in Grafenwhor, Germany, handles the in-station weather briefing for that airfield, with the possibility of extending that service to telephonic briefings in the near future.

The Air Force does an excellent job of providing weather service to Army Aviation in Germany. It is considered to be one of the biggest operations by total volume of DD 175 weather briefings in the entire Air Force Weather Service.

AFOF exists in Germany to make Army Aviation more responsive to the commander in the field. It is providing a vital service in enhancing safe and expeditious accomplishment of the Army Aviation mission.

Play Ball!

MANY RABID baseball fans recall Ping Bodie, a baseball umpire who had a unique way of making a point.

Years ago Bodie was absorbing an unusually heavy amount of abuse from the fans while calling a minor league game in California. Suddenly Ping threw up both arms and stopped the game. He walked up into the stands, adjusted his chest protector, and bellowed, "Play ball!"

The team managers rushed up to Bodie and demanded to know what he was doing. "Well," Bodie drawled, "if these folks can see 'em better from up here, then here's where I'll call 'em from. Play ball!"

Too often we find ourselves reacting like baseball fans — blithely criticizing some aspect of Army Aviation as if we were in the best position to judge all actions, when actually we're sitting up in the stands.

The *least* we can do is take a tip from Ping Bodie. He was willing to view the situation from all angles.

I LOVE MY GOLDEN VOICE
WATCH THOSE ARROWS ... THEY'RE POISON
DUCK THAT A-FRAME, MAC
DON'T SCARE THOSE MONKEYS
DON'T PICK THE BANANAS

Major Milton P. Cherne

Irrelevant radio transmissions during operations are as effective as enemy jamming capability.

MY GOLDEN VOICE

I love to hear my voice
Ringing through the air.

And when I use my radio
My golden voice is everywhere.

Maj Cherne is Chief, Armament Branch, Aviation Combat Developments Agency, Ft Rucker, Ala.

"LIEUTENANT," scowled the captain, "as far as I'm concerned, the only reason Uncle Sam gave you that radio to use was so you could listen. Don't you EVER use that radio again unless you really have something important to say and then be brief, but clear. I don't like the sound of your voice on that box and the only reason I let you turn it on is so you can listen to me. How in blazes do you expect me to control the unit when you're gabbing all of the time?"

"But, Sir, I . . . ."

"No buts, Lieutenant," the

now raised voice replied. "As far as I'm concerned this unit is on listening silence all of the time. If your platoon were trained as well as they should be and if you worked out a few local SOPs you could control this recon platoon with few transmissions. DO YOU UNDERSTAND, LIEUTENANT?"

"Yes, SIR," was my meek concluding utterance.

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How many of us (aviators and ground commanders) have been thoroughly frustrated while on maneuvers because of individuals jamming the net with irrelevant transmissions. Their efforts to relay a thought were as effective as any enemy jamming capability.

Flying is demanding and tedious enough without going through the throes of attempting to soothe a thoroughly irritated temper. Even the patience of the most patient can be tried by a determined operator who is going to get a message out, regardless of his location, the strength of his transmitter, or the side effect he is creating on the tactical situation.

After all, someone might have something *really* important to say if he would stay off the air long enough for another operator to send a message. This is a glaring sign of poor training during maneuvers, but it is an unforgiveable sin when you are maneuvering for real.

Radio discipline and unit SOPs can materially reduce the use of the radio. Let's listen in on the radio transmissions of one of the helicopter units in Vietnam after several months of combat support operations. I must emphasize the word "after" because they, too, had to learn many things, to include the true value of the aircraft radio.

CH-21C at altitude en route to LZ during operation with escort T-28 VNAF

The mission will call for the use of sixteen CH-21s, two TO-1Ds, and two T-28 close support airplanes. Already we have 38 people who have direct access to the microphone and who would like to hear their golden voice on the air — 38 sweaty palms with the mike within easy reach of temptation.

At 0515, the engine of Chalk #1, the lead aircraft, barks to life and is rapidly followed by 15 other CH-21s. At 0520, the first FM radio transmission is made. "One to two, two to three, three to four," etc., down the line until the last aircraft reports back to Chalk #1. The entire transmission time was less than 30 seconds. This drill was considered a must to ensure that all aircraft were receiving and transmitting on the unit's assigned primary frequency. If one of the aircraft had neglected to report in, the leader would have contacted him on the secondary UHF frequency. He would know that he would have to make one special transmission over the UHF channel to that aircraft if an important change in plans was called for.

Slowly and awkwardly the 16 cargo transports file out to the takeoff position, followed by the TOs. They are barely silhouetted against the first gray light of morning, giving them an eerie appearance. At 0530, the leader picks his ship up to a hover and remains motionless for 15 seconds. No more, no less. All of the pilots had been briefed for a 0530 takeoff and are expecting this maneuver. The 15 seconds give them time to bring their engines up to takeoff rpm and alert them for subsequent movement. The takeoff is accomplished without the use of the radio.

0534. Radio silence is momentarily broken by this transmission: "Chalk #16 closed." This message indicates to the lead aircraft that the flight is in the proper formation and he may increase his airspeed to normal cruise. All other aircraft have been monitoring the radio and upon hearing the transmission, expect the flight leader to slowly gain speed. This reduces the accordion effect of the flight. The flight leader eases the nose of the helicopter down and increases his speed to 85. The process is

"Hands are clammy; your back is saturated with old-fashioned sweat . . ."

not an abrupt maneuver, but a slow gathering of momentum as the flight moves forward into a cloudless morning.

"Ladyship One, this is Brushfire One over rendezvous, checking into the net."

"Roger, Brushfire. Out."

Ladyship One in the lead ship breathes a small sigh of relief, knowing that the Republic of Vietnam T-28s are in position and ready for the day's work. It is a reassuring feeling to have firepower immediately available to wipe out targets of opportunity that could interfere with the accomplishment of this mission. Transmissions to Brushfire must not be blocked by a crowded net.

0555. "Flight, go to trail, go to trail" cracks over the radio. The leader pushes the ship up to 100 knots to permit the successive aircraft to slip into the formation that will be used for landing at the troop pickup site. Each pilot deftly eases his ship into the trail position and makes his prelanding cockpit check.

So far, the radio has been used three times: twice on the tactical net and once on the UHF channel.

0605. The crewchief of Chalk #1 scrambles back on board and informs the pilot that all aircraft are loaded. After helping his troops on board, the crewchief had temporarily dismounted and moved to a vantage point to see down the long column. As the troops boarded the last aircraft he immediately notified his crew that all was in order and everyone was ready to go.

Now Chalk #1 taxis out to the lineup into a conspicuous position. Immediately b e f o r e picking up to his 15-second alert hover he radios, "Chalk One rolling." If anyone is having problems, now is the time for him to speak. No return comments are heard and the first aircraft lifts into the air and shortly thereafter initiates his takeoff. Once again the flight gains momentum and once again the last aircraft calls when the flight is closed.

Now the flight is roaring across the once docile countryside, keeping low and climbing only high enough to avoid obstacles in its path. On the ground the water buffalo are scattering, and surprised women and children dash toward the dwellings. Before they can react to the situation, the flight has passed and is racing for the objective.

"Leader, this is Control. Over."

"Roger, Control. Out."

We now know that the TO which is acting as our eyes high above our heads is in position and has the flight pinpointed. We also know that communications are OK, and we will not have to sweat the ground navigation quite as much. This does not relieve the lead ship of the responsibility for navigation, but is an excellent backup should the occasion warrant it.

Now the personal tension is starting to build up. Hands are clammy, your back is saturated with old fashioned sweat, and you are keyed up to a high degree of alertness. The copilot is feverishly studying his map and softly cursing to himself. The ditches are filled with water and look like creeks, while the creeks are overflowing and look like streams. At this speed and altitude, the countryside all looks alike.

"Brushfire One, danger area my right, along woodline. Come in parallel as I start approach in three minutes."

0623. "Leader, this is Control; turn left zero five degrees. You will start approach in one five seconds after crossing next treeline."

This simple transmission took weeks to develop. It is extremely difficult to look down and judge the speed of the low flying choppers, much less to time their approach and the distance they will cover after initiating their flare for landing. For this reason, the same pilot always flew in the lead ship. His habits, traits and idiosyncrasies became known to control and the rest of the flight. They know within feet, how far he would coast be-

fore terminating at a hover and discharging his troops. With this knowledge, they could pick their spot in the area and make a precision approach rather than floundering around the area.

0625. "Chalk One starting approach."

"Chalk Four, automatic fire three o'clock."

"Chalk Ten, fire eight o'clock."

"Roger," to both replies comes from Control Two (TO-1D). He has converged on the flight at the objective area and has the position of each helicopter in the formation embedded in his mind. When a ship calls out that he is being fired on, three things happen simultaneously. First, Control Two mentally fixes the location of the fire in his mind with geographic references. This will permit him to assist the RVN attack aircraft in finding and destroying the target. Second, the gunners of the other ships are alerted to the danger area and begin to pour huge amounts of machinegun fire into the threat. Last, the ship behind the one calling out the fire throws a smoke grenade out the door to further assist the support aircraft in locating the target.

Control Two can give them a heading and distance from the smoke with less radio chatter than he could if he had to describe the geographical reference points. Although the intercom is filled with excitement and instructions, the radio net remains silent. All ears are tuned for additional fire locations and instructions from the lead ship. Without a word, Chalk #1 breaks ground and takes off, followed by the rest of the flight. There was no need to encourage people to get out of that place.

0644. "Flight, go to trail." And once again the choppers line up for landing. As the rotor blades grind to a halt, the flight leader heads for the CP to receive any additional instructions or changes in plan. The crewchiefs and gunners carefully inspect their ships for bullet holes or other damage while one pilot from each aircraft assembles on the center ship. At this location they will be debriefed by intelligence and remain for further verbal orders from the flight leader. The pilot remaining with the aircraft can take it easy, but must be prepared to start the ship up immediately if we all dart for our aircraft on a dead run. This means trouble and every second counts.

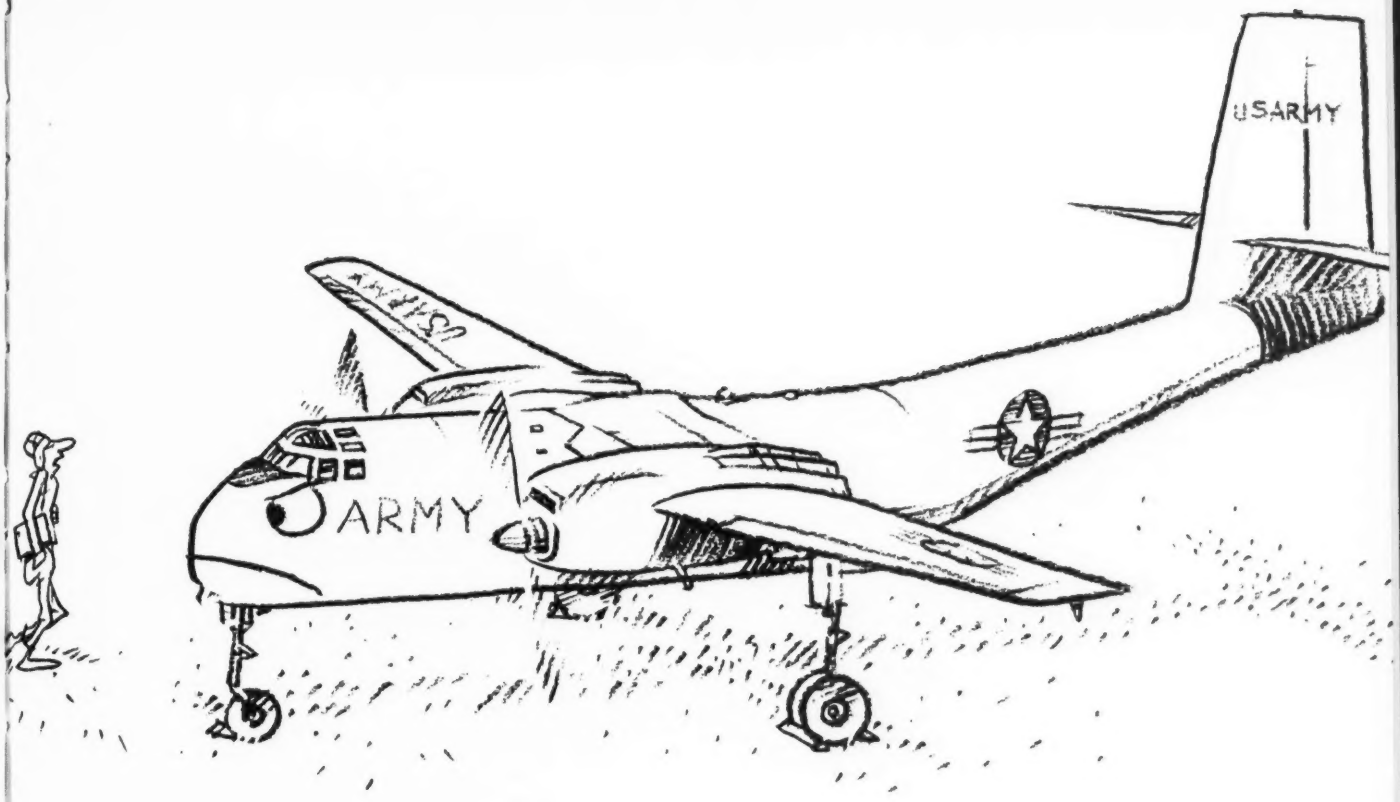
At long last the flight is released to return to home base. The flight leader briefs the flight on the accomplishment of the assault and gives them a start-engine time and the formation that will be used going home. Without further ado the flight takes off and forms up with the last craft giving the only transmission: "Chalk Sixteen, closed."

Thirty minutes later the concluding transmission is given: "Flight go to trail, go to trail."

It is with a feeling of relief and a sense of accomplishment that the 16 helicopters are guided into the landing formation at their home base. It will seem like a relief to be able to get out of the ship and talk to someone again.

Before you reach for that mike, THINK!

RVN ranger company sets fire to house occupied by suspected VC while escort UH-1 stands guard



Like little snowballs roaring down a long hill, "minor" maintenance discrepancies can become big problems in a short time. And who is the man in the best position to stomp on these snowballs while they're still small, to catch discrepancies while they're minor? The maintenance test pilot, key to any unit's preventive maintenance program.

Unit Test Pilots

CWO Joseph R. Connor

This article is written with primary emphasis toward helicopters; however, the ideas expounded for unit maintenance test pilot training could also be applied to fixed wing aircraft.

AN EVER-INCREASING number of aircraft are being added to the Army inventory, and it would be logical to assume that a larger number of unit test pilots are needed. But the depletion of experienced maintenance test pilots through

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a qualified test pilot would greatly aid your maintenance officer

attrition and promotion has been felt in many units.

We cannot afford a gap in replacement of this very special type pilot. He is essential to the overall effectiveness of the aviation unit. His responsibility is far-reaching in providing fully operational and mechanically safe aircraft, also in detecting minor discrepancies and ensuring that they are corrected before their devastating effects have time to deteriorate the system or component. Many of these minor discrepancies are possible contributing factors of many past accidents labeled "Pilot Error."

Take the case of an accident that resulted in extensive damage to a CH-34C due to a late power recovery from a practice autorotation. Consider these possible contributing factors: stiff throttle, throttle correlation low, collective pitch heavy. If one or more of these *minor* discrepancies had not existed, an accident might not have occurred.

Take the same discrepancies above and consider the pilot who lost rpm on takeoff with a sling load and subsequently settled in on top of the load. Both accidents were labeled "Pilot Error." Costs of these type accidents are enormous.

The Aircraft Maintenance Officers Course is presently training officers in subjects pertinent to the maintenance and test flying of aircraft. This is a good approach to providing maintenance officers, whose duties are very complex and include such things as coordinating aircraft requirements with the operations officer, coordinating maintenance requirements and scheduling with the next higher echelon; serving as maintenance advisor to the unit commander, and as maintenance platoon leader; and many other administrative and supervisory duties. *The* maintenance officer just doesn't have time to test fly all the aircraft assigned his unit. Consequently, he must rely on other pilots to perform the duties of unit test pilots.

These pilots may or may not have attended the AMOC course. Experience is a good teacher, but this method has the inherent problem of requiring years to build satisfactory knowledge. What type test flights will be performed while pilots are becoming experienced? For example, let's take the pilot who has 2 years experience as a test pilot in a CH-34 unit. He is transferred to a CH-21 unit and gets his checkout in the aircraft before arriving at the unit. Naturally he would not be assigned to test fly CH-21s until after he had become much more familiar with the aircraft. Experience is a long drawn out procedure as a teaching method. Formal training, followed by experience, is by far the most preferred process of learning.

We have seen the need for technical inspectors and have made satisfactory progress in obtaining and training selected individuals in this field. It is difficult to retain commissioned officers in maintenance jobs at user level due to promotions and career patterns. Would it not be advantageous to train warrant officers as test pilots so promotion would not affect assignment?

The warrant officer could be trained in test flight procedures by specific types of aircraft, in a formal course of instruction. The course should include ground school and flight training. This would result in a tremendous saving to the Army since the test pilot could be assigned to any unit, regardless of echelon of maintenance. His formal training together with experience would enable him to become a highly skilled technician who would improve our availability rate and reduce our accident rate.

Diagnosing maintenance discrepancies and correcting them is very important, but none the less important is establishing maintenance practices and procedures that will reduce recurring discrepancies. If the maintenance officer had a graduate from a formal course of instruction, he would have at his disposal a highly qualified test pilot, a man who could assist him greatly in preventive maintenance.

I feel that by developing and maintaining current a worksheet as complete as the inspection guide of the -20, or more so, we could systematically include additional ground and inflight checks that would enable the test pilot to detect more discrepancies sooner, thereby providing more advance notice on parts needed. Also, detecting and correcting minor discrepancies before further damage is done would greatly reduce the requirement for spare parts and unscheduled maintenance. The end result would be higher availability rates and fewer accidents.

The test flight worksheets

could be initiated during the aircraft's initial 1,000-hour acceptance test. More technical assistance is available and more concentrated flying is encountered during this test than at any other time. Many of the problems that will be encountered in the field are encountered during the test but cannot be entirely eliminated by engineering change proposals (ECP). Therefore, known problems and potential problem areas along with routine check items should be listed on the test flight worksheet so the possibility of omission on subsequent test flights will not exist.

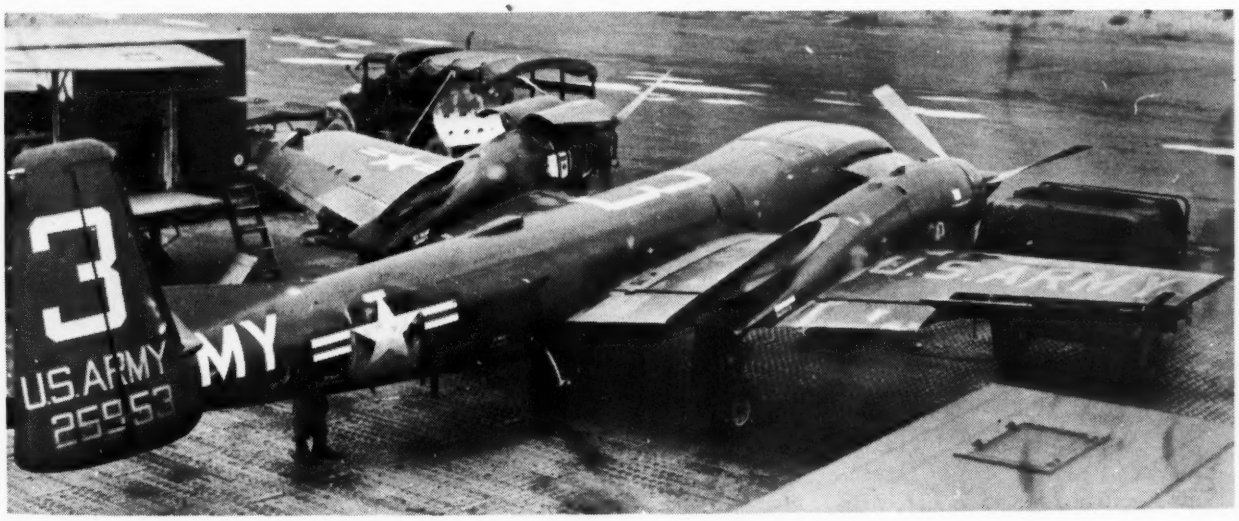
The Equipment Improvement Report (EIR) provides an excellent program that could be used to disseminate information Army-wide, that could be used to maintain current the test flight worksheets. This would also provide for more consistent parts usage Army-wide, since all aircraft by type would be receiving the same thorough testing during each complete test flight.

In conjunction with the establishment of a formal course of instruction for maintenance test pilots and a revision of the current test flight worksheets, a manual should be written to provide the test pilot with pertinent information regarding:

- Aerodynamics, advanced (general)
  - Semi-rigid rotor
  - Fully articulated rotor (single and tandem)
  - Rigid rotor
- Theory of flight
  - Tail rotor drift
  - Transverse flow effect
  - Translational lift
  - Blade stall
  - Gyroscopic precession
  - Corriolis effect
  - Dissemetry of lift
  - Tilt of the main rotor mast
  - Autorotations
  - Other pertinent subjects
- Vibrations (normal and abnormal)
  - Vertical
  - Lateral
  - Low frequency
  - Medium frequency
  - High frequency
  - Elaborate on courses, methods of detecting and isolating
  - Blade track — dynamic and aerodynamic unbalance, mixing of high and low time blades, ground and flight checks
  - Tail rotor balance check (installed)
- Engine power checks
  - Temperature and altitude effects (turbine and piston engine)
  - Formula for determining actual power output
  - Sample chart to record performance for each check
  - This chart would be used to check for any deterioration of engine performance
- Engine analyzer and vibration detector operation and interpretation
- Flight instruments and navigation radios
  - Operations
  - Inflight testing (tolerance)
  - Radios, operations and tolerances

Much of the above information is found in a number of books, manuals, and other publications. Some duplication may be necessary. Some publications, such as TB AVN 23-16, could be incorporated in this manual. The need for thorough training and providing sufficient information and guides for the test pilot to prepare and perform complete test flights and thoroughly evaluate the performance of the aircraft cannot be overemphasized.

Would your unit test pilot be adequately trained to test fly this Mohawk after maintenance pulled a PE?



Have you considered a flight standardization team as one method of reducing your accident rate? Here's how one team is accomplishing its assigned mission in this type of operation.

Standardization in Seve

IT'S 0730 HOURS, and today is any Monday. The month doesn't matter either, for the Seventh Army Aviation Safety and Standardization Detachment (SAASASD) is readying itself for another visit to a Seventh Army Aviation unit, as it has continually since 1959.

At Stuttgart Army Airfield, the home of SAASASD, few heads turn any more at the sight of the team, normally four men, preparing for takeoff. They usually travel in a U-6A, the ubiquitous "Beaver."

The pilot and copilot for the flight to Anywhere, Seventh Army, check into base operations and pick up the tail number of the aircraft assigned to the team. They move quietly upstairs to the flight planning room and to the Base Weather Station, manned by Detachment #6 of the 7th Air Weather Squadron. Pleasantries are exchanged on the way with the weather operations officer, representing the Air Force at this otherwise all-Army installation.

A flight plan is filed and called in to AFOF, Army Flight Operations Facility [see page 12], with the tentative takeoff time affixed, and the team leaves operations for the ramp. They will be gone 3 to 5 days.

What is the Seventh Army Aviation Safety and Standardization Detachment (SAASASD)? What is its job?

The purpose of the detachment is to provide a standard method of instruction, administer flight examinations to applicants for instructor pilot qualification, conduct transition training, and determine the proficiency of aviators in the various types of aircraft. The detachment also ensures that proper and uniform standards are used in performing the flight procedures and maneuvers for assigned aircraft. The unit also provides a nucleus for the Standardization Board and the Instrument Examining Board.

A need for standardization was recognized by Seventh Army in 1953. They began by setting up a formal Method of Instruction course run by the Seventh Army Aviation School at Stuttgart Army Airfield. Its mission was to make certain that the various maneuvers in Army aircraft were being done in the

Captain Robert C. Cook, Jr.

eveth Army

Below left:
IP keeps critical eye on Army Aviator as he makes a preflight check on UH-1B
Below:
Concentration is shown on face of aviator as he takes written test for IP rating

same way by standardizing unit instructor pilots. This provided one solution, but the units were unable to spare the aircraft or the personnel for the time required to train instructor pilots.

In 1955, to preclude the loss of the aviators and aircraft from the unit's mission the Method of Instruction course was dropped. For the next four years, Seventh Army made little change in its approach toward standardization until the Aviation accident/incident rate showed the need for a more active program.

In 1959, a two-man standardization team was formed. They traveled throughout Seventh Army, giving checkrides, written tests, and instruction as required. The results seemed to be good, but the physical requirement was far above the capabilities of two men. It was practically impossible for two aviators to be current and proficient in all types of aircraft and accomplish all the requirements of standardization.

In 1961, still using the two-man team, the additional mission of procuring and publishing checklists, instruction guides, and standardization guides to be used by Seventh Army Aviators was assumed by the Standardization Board.

With this additional mission and the increase of aviation in Seventh Army, the need for a larger board was obvious. In November 1961, Seventh Army regulations authorized certain units to have standardization pilots for certain types of aircraft. At the same time, it called for a Standardization Board president to maintain control over the proceedings of the board members.

On 1 July 1963, the Standardization Board became the Seventh Army Aviation Safety and Standardization Detachment, with a 50-man complement. This change enlarged the team from four to nine officer members and increased the number of office personnel. The new

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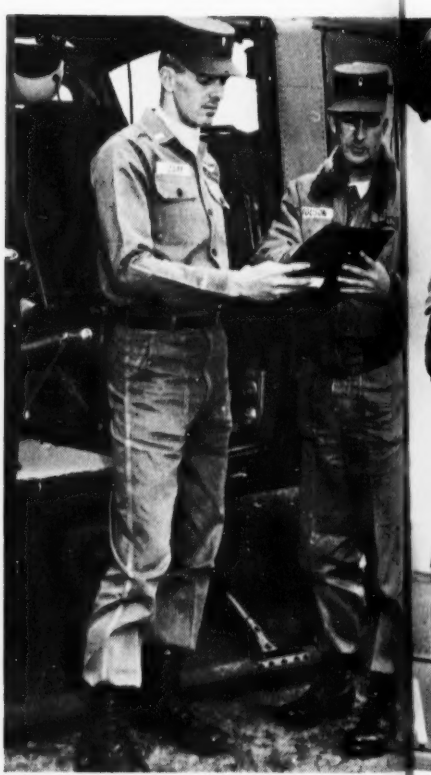
Capt Cook is assigned to the 16th Aviation Detachment, APO 46, U. S. Forces.

IPs prepare for a postaccident checkride at Darmstadt Army Airfield

IPs pull preflight on UH-1B



detachment includes both the nucleus of the Standardization Board and the Instrument Examining Board. The commanding officer of the detachment is president of both boards, under the operational control of the Seventh Army Aviation Officer. A visit is made to each aviation unit in Seventh Army twice a year, and assistance can be given to any unit which requests it.

The Seventh Army Flight Safety Officer accompanies the team on each visit to check and standardize aviation safety requirements. The new TD provides for an aviation safety officer as a member of the detachment, since standardization and safety are inseparable.

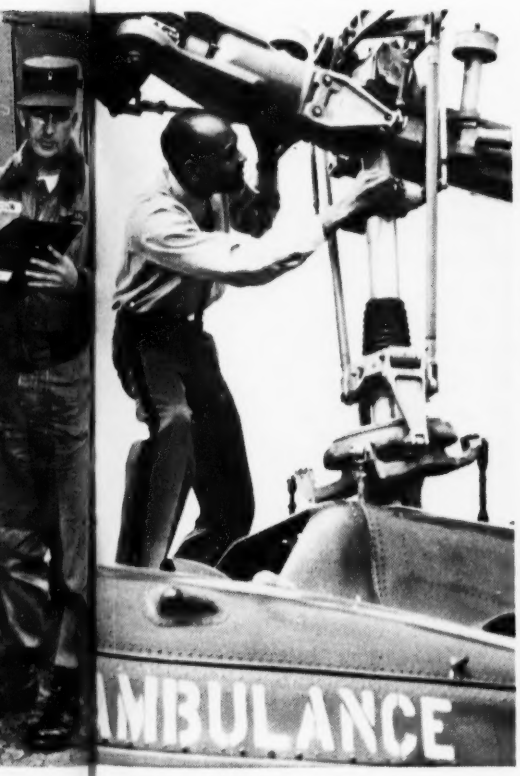
Each aviation unit is notified six months before the planned visit of the Standardization Board members by the Seventh Army Aviation Officer. He gives them the date and the period of time the members will remain with the particular unit. If there is any conflict with the scheduled date, the unit can request readjustment. There is further communication between the Seventh Army Aviation Office and the unit involved as the date approaches to ascertain readiness for the scheduled visit.

When the team arrives, they are met by the unit commander or one of his representatives. They sit down with the commander and go over the program in detail. However, the visit has just begun. The Standardization members organize classes on training, safety, and standardization. Spot checkrides are given to aviators picked at random to determine their individual proficiency and the standards required and maintained by the unit. Flights with instructor pilots make certain that they are instructing aviators in their unit according to accepted and established procedures. The team can also give instrument checkrides.

Most aviation unit commanders realize the advantages to be gained by presence of the team and request further assistance in specific areas.

After these classes, instruction rides, and flight safety talks, the team gives the commander an honest evaluation of his unit's proficiency. Each team member takes comprehensive notes. Upon return to Stuttgart, they file a formal report to the Seventh Army Aviation Officer. The Safety and Standardization Detachment is his source of information on the state of readiness of the aviation units to perform their mission under all conditions.

Army Aviator checks UH-1B rotor blades during preflight



Seventh Army IP loads his baggage in a U-6 at Darmstadt Army Airfield. Destination: Anywhere in Seventh Army area.

crash sense

PREPARED BY THE U. S. ARMY BOARD FOR AVIATION ACCIDENT RESEARCH

One, two, buckle my shoe.
Three, four, shut the door.
Five, six . . .

PICK UP STICKS

A JOINT FIELD training exercise was taking place on rolling, heavily wooded terrain. An Army Aviator flying an OH-13H had a battalion commander as his passenger. Here, in the pilot's words, are the events leading to the accident:

"At approximately 1200 hours, I received a warning about jet strikes in my area. Since we were in the vicinity of the colonel's jeep, I suggested we return so that I could shut down. This would conserve fuel and he could monitor the radio from his jeep.

"The landing site, on the side of a hill, was the same place I landed in to pick him up that morning. The best spot appeared to be near where I made my first landing, on a trail leading up to the crest. I saw that a pile of logs was stacked on the downslope side of the trail, but it was next to the most level looking spot on the trail.

"I had no difficulty in landing, other than requiring nearly all of my left cyclic to get my right side down.

"I shut down and got out to inspect the aircraft. I was mainly interested in oil leaks since I had been using a little over a quart an hour. While inspecting the right side of the engine, I saw that the right skid was approximately one foot from the pile of logs."

And here's the passenger's description of the accident:

". . . The pilot checked to see that I was in the harness and we checked the intercom. At 1207 hours we started to take off.

"We were facing approximately north and the right side was on the downhill side, near the wood pile. I believe the skid hit on a stick of wood which was out further than the rest of the stack. The wood pile seemed to 'peak' as it was lifted. It appeared that we'd knocked over most of the wood pile and almost made it. We gained speed rapidly but could not level off. I felt several violent jolts which I believe were caused by the blades hitting the ground. Then we crashed on our right side and plane parts flew everywhere."

The aircraft was a total loss, but the pilot and his passenger escaped with minor injuries. The accident investigation board did an excellent job. Their report is an outstanding example of the way accident reports should be prepared. It is

complete in every detail and well supported with evidence.

The board found that this accident was caused by selecting a landing site near an obstruction, by not recognizing the hazards presented by the wood pile, and by not taking corrective action to move the wood pile or decrease the weight on the right side of the aircraft by having the passenger exit while the aircraft was moved to a more suitable pickup point. The board recommended that these cause factors be given wide dissemination to all aviators.

The flight surgeon's analysis and recommendations in this report also bear repeating.

Analysis

"The possibilities of a successful takeoff were severely jeopardized when the pilot selected a landing site on a 10° slope to the right with an obstruction, 2 feet in height, just 12 inches off his right skid. When the aviator failed to recognize his peril and take corrective action, it would appear that an accident was almost inevitable.

"That the aircraft slid or moved to the right before or immediately after lift-off is indisputable.

Possibly contributing to the lateral movement are the following: the force on the aircraft causing it to 'hang' perpendicular to the rotor blades, the 10° slope which required all or nearly all of the available left cyclic to level the aircraft, the disproportionate weight on the right side of the aircraft of at least 75 pounds (considering about 23 pounds of field gear plus the weight differential between pilot and passenger). The disproportion is greater if you accept the contention that gasoline flowed from the left to the right tank during the 30-minute interval the aircraft remained on the slope.

"Possible corrective actions, had the pilot been aware of the aerodynamics involved, would include removal of the obstacle and lessening the weight on the starboard side of the aircraft.

"There were no psychological, physiological, or pathological factors considered contributory in this accident. Sleep and diet were adequate and there was no evidence of fatigue.

"It is important to note that the pilot's helmet was cracked just over the left ear. This is indicative of the amount of force absorbed by the helmet. The aviator was apparently wearing the visor in the up position but it fell down about halfway at impact. The lower portion of the visor over the left eye was broken off but not shattered. Had the visor been in the down position the aviator would have been better protected. It was not determined if the shoulder straps were tight; however the locking lever was in the unlocked position. The inertia reel was locked. This injury could very probably have been lessened if the shoulder straps were tight and the locking lever in the lock position. The helmet worn by the passenger was thrown free. The chin strap was not fastened.

Recommendations

"1. That the cause factors and aerodynamic principles discussed in this accident report be considered and brought to the attention of all aviators who may profit by them.

"2. That aviators are reminded of their responsibility to see that their passengers as well as themselves are properly prepared for takeoff, i.e., helmet in place and chin strap snapped, lap belt and shoulder harness snug, etc.

"3. That aviators place the shoulder harness lever in the lock position on all takeoffs and landings.

"4. That aviators place their visors in the down position for all takeoffs, landings, and low-level flights."

Seven, eight, lay them straight.
Nine, ten . . . It's Happened Again!

This time without the sticks. It was another field training exercise and the OH-13H pilot had carried his passenger to several areas in their sector. We take up his story from this point:

"We flew around the area for several minutes and decided we should discuss the situation with the troop commander. We located him in a position along a road. I flew over his position and decided to land in an area on the left side of the road. The field was half plowed and half in grass.

"As I approached, I noticed there was a slope to the field. However, I thought the slope was not excessive for landing. I picked an area on the grass next to the plowed field. As I came to a hover, I set the left skid down first and then the right. As I started down on the collective control, I felt the aircraft starting to slide down the slope. I started to apply collective pitch when the right skid stopped on something, causing the helicopter to tilt on its side, and the main rotor blade struck the ground. We hit on the right side, flipped back up, landed upside down, and rolled to the right where the aircraft came to rest."

Investigators measured the slope at the scene of the accident and found it to be 11.8°. From this and other evidence, they arrived at these cause factors:

Attempted landing on slope which exceeded the safe operating limitations of the OH-13H aircraft.

The surface of the intended landing site was smooth frozen ground, presenting an additional hazard for a slope landing.

Failure to use correct emergency procedures after the aircraft had exceeded a right bank of 7.5° below the horizon, in that the pilot continued to apply power and collective pitch with

Slope measured 11.8°

the aircraft beyond the angle of cyclic control.

During a post-accident flight examination, it was noted that the pilot had difficulty with the use of collective and cyclic controls during slope operations. It was also noted that he had difficulty in judging slope angles.

Here's what the USAAVNS says about OH-13 slope operations: "Slope landings should be made crosslope with the skid type gear. Landing on a slope requires a delicate and positive control touch. This helicopter must be lowered from the true vertical by placing the upslope skid on the ground first. The downslope skid is then lowered gently to the ground and, at the same time, corrective cyclic control is applied to keep the rotor plane in the true horizontal (assuming wind conditions). If the pilot runs out of cyclic control before the downslope skid touches the ground, he will know the slope is too steep and should recover before completing touchdown. Inexperienced pilots are prone to lower collective pitch too fast or fail to use sufficient cyclic control to keep the rotor disc parallel to the true horizontal. . . ."

Don't Turn Back

The Bird Dog pilot lined up on a 1,500-foot PSP runway for his fourth takeoff of the afternoon. He had been flying observer over a beach landing being made by a transportation medium boat company. Several times he had also flown as the aggressor and "bombed" these troops with flour sacks.

The mags were checked, fuel pump turned on, and the flaps lowered. Everything was O. K. and the throttle was rammed forward for takeoff. When the aircraft reached 200 feet, the flaps were retracted, and the fuel pump was turned off. At 300 feet, as the pilot eased the throttle back to climb power, the engine had a momentary interruption of power (usually referred to as a cough). Instinctively the pilot closed the throttle and started an immediate steep turn to get back to the runway!

The plane went into an almost vertical descent

Could you finish this story? Most of us would visualize the pieces strewn over the ground, with a crash truck speeding for the scene to make a futile effort to save a life. Not so in this case. This pilot escaped to fly again, though the aircraft sustained major damage.

After the pilot started the turn, it was followed at once by a stall. The plane went into an almost vertical descent, as witnesses later stated. The pilot fought for control all the way to the ground. Before impact, he had the wings almost level, and the angle and rate of descent had been shallowed considerably. Impact was made 1,000 feet short of the runway in the sand that surrounded the strip.

The left gear was sprung up and back and the bulkhead was ripped by the impact. The propeller was curled 5 inches on each end as it contacted the sand. When the aircraft bounced, the pilot applied full power and regained flying speed. As the plane came over the end of the runway, the left gear was held off as long as possible. Upon contact of the damaged gear with the runway, the aircraft veered to the left edge of the runway and came to a stop 90° to the runway.

Several actions in this accident need further scrutiny, but the one I consider the "beginning of the end" was that the pilot attempted a return to the field from such a low altitude.

It is very doubtful that a student aviator could graduate from flight training without being warned by his instructor never to turn back to the airfield on takeoff when the altitude attained is less than 500 feet in a liaison plane or 1,500 feet in heavier types. Any turn exceeding 90° under these circumstances was forbidden. Yet most of us have had that irresistible urge to turn back to that long, smooth runway behind us. That might be a fatal decision if we don't quickly realize that insufficient altitude exists to complete the required 180° turn.

If you want to fully realize the altitude that is necessary to complete a 180° turn with power off and only climbing airspeed, try it yourself in an 0-1. Climb to at least 2,000 feet and, from that altitude, start a normal climb at 2300 rpm and 80 mph. When you reach 2,500 feet, cut the throttle and start a 180° turn, maintaining 80 mph all the way around. If you can complete the turn without losing 230-250 feet, it will be an exception.

There are two "big" reasons for not attempting a 180° turn from a low altitude back to a field you have just left. It requires considerable altitude to complete the turn and you are on the verge of a stall if the turn steepens.

What are the advantages in going straight ahead if you get an engine failure on takeoff? The greatest advantage is that you have control of your aircraft up to the moment of impact, and it can be maneuvered into the most advantageous position. With control over positioning of the fuselage, you are assured to a large degree that the occupants of the aircraft will walk away from the crash.

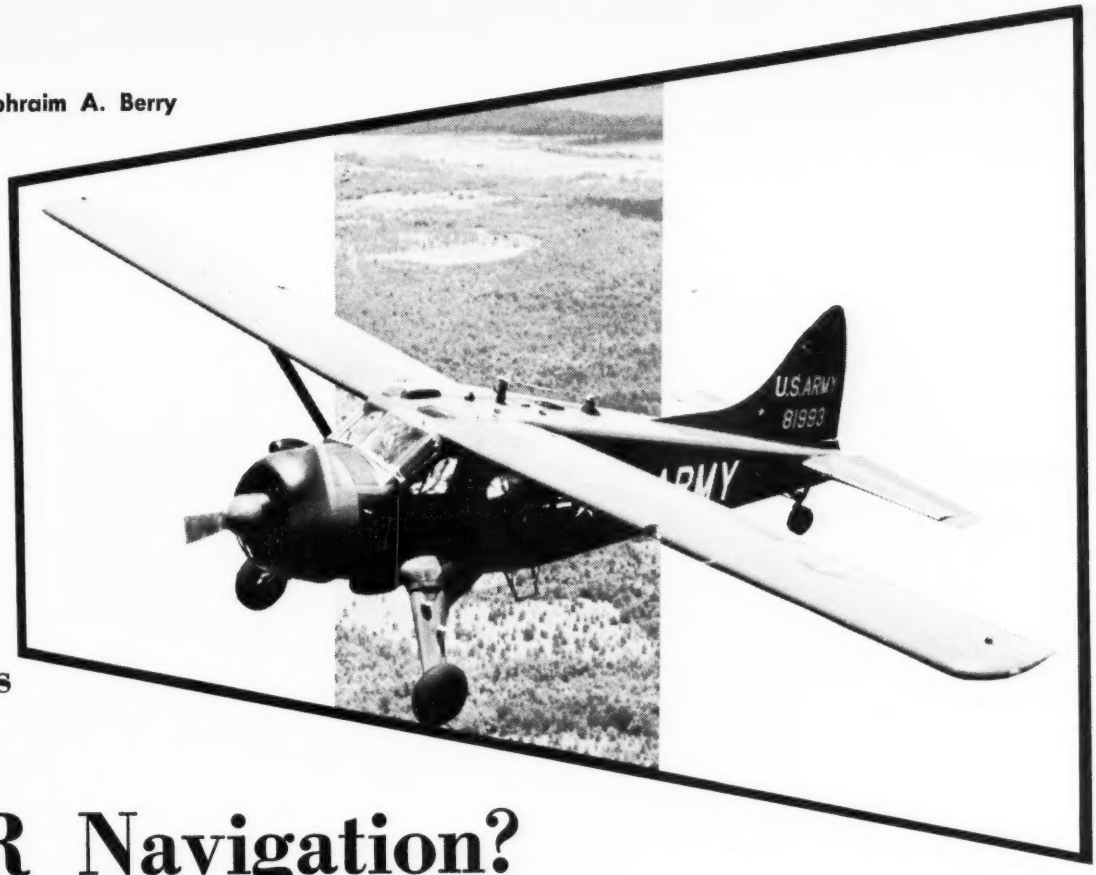
Another advantage of descending straight ahead is that you remain in flight longer and more time is available to initiate emergency procedures. When you make a steep turn there is little time to devote to anything else. The more time the pilot has, the less likely he will be to panic. The pilot of our 0-1 did panic. He closed the throttle when the engine coughed and it was not reapplied until after the impact!

Many indecisions that have occurred during takeoff emergencies could have been avoided if the pilot had taken the time earlier to learn the forced landing areas near the airfield. With a knowledge of the accessible areas in front of him, he would not be so tempted to turn back to the airfield behind him. Learn those areas around your field before this happens to you.

The next time you make a takeoff, be prepared. If that "never happen to me" emergency occurs, take a deep breath, flip your switches, and look for an opening ahead, but DON'T TURN BACK!

Many thanks to Capt B. W. Addy for sending us "Don't Turn Back."

Major Ephraim A. Berry



How's Your DR Navigation?

SUPPOSE YOU are on a VFR flight in a U-6A aircraft. Weather is clear and 1 to 3 miles visibility in smoke and haze. Forecast winds have proved reliable during the first portion of the flight. You have been using radio as your primary means of navigation. Suddenly the "off" flag pops up on the omni receiver, and no amount of cranking on the coffee grinder gets you a usable signal from any station. You reach up to tune in the ADF and receive only a deafening silence.

What now? Do you reach for the big red panic button? Or do you reach for your E-6B computer and use that old fashioned and sometimes virtually forgotten method of getting from point A to point B — dead reckoning navigation.

Today's navigation equipment is highly reliable; however, any piece of mechanical equipment can fail, and you may be the one who is up there when it does. Army aircraft are operating in areas of the world that have few if any of these aids. In addition, many of these missions will be flown at low altitude over terrain with few if any prominent checkpoints. These are good reasons for all of us to check our ability to get from point A to point B without the use of radio aids to navigation.

As a refresher, here are the important factors in DR navigation.

- *Drift Correction.* If wind information for the route is available, this can be computed on our old friend the E-6B computer. If not, get the aircraft on the desired heading, pick two checkpoints in line as far out as visibility permits and then establish a heading which keeps the aircraft on this line.
- *Groundspeed.* This can be computed using true airspeed and wind information or from elapsed time between checkpoints.
- *Heading.* Desired heading must be maintained accurately. You cannot expect to hit your destination if you wander all over the sky during the flight.
- *Confidence.* In my opinion, one of the most important factors in successful DR navigation is the aviator's confidence in his ability. *This confidence can be acquired only by continual practice.*

If there is any question in your mind about your proficiency in DR navigation, better get out and try a few cross-country flights without using radio aids to navigation. The results might be surprising . . . and save your life!

Diagnosing the Trouble

Captain Kenneth E. Cox

IMAGINE THE exasperation of the crewchief of an 0-1 when the pilot taxis back from a pre-takeoff runup, shuts the engine down, and simply writes "rough running engine" in the -13. This writeup might be valid to the pilot, but tells the mechanic as much as the Chairman of the Board might mention about the Coca Cola formula.

"Oh, Lieutenant Gnuzzelgunch! Sir, would you wait up a moment? I'll get right on this engine. Can you tell me what the indications were when you ran 'er up so I'll know where to start trouble-shooting?"

Lieutenant Gnuzzelgunch stops, shifts his flight helmet to the other hand, and gives the appearance that he's conducting a high level strategic defense briefing for a touring WCTU group.

"Everything checked OK until the 1700 rpm ignition check. I started from 700 rpm and increased the throttle to 1700, observing the generator kick in around 1300. At 1700 I made the mixture and carburetor heat check — all OK. Then during the magneto check (still at 1700 rpm) I got a 50 rpm drop when I switched from BOTH to LEFT. The rpm returned to 1700 when I switched back to BOTH.

"When I switched to RIGHT I got a 150 rpm drop and a rough running engine — no backfire or afterfire. The rpm returned to 1700 when I switched back to BOTH. I idled back to 750 for the idle mixture leanout check. As I brought the mixture control to the rear the rpm increased to 780 before falling off. Naturally I returned the mixture control to the FULL RICH position and proceeded with the full acceleration check. I could get only 1900 rpm out of her, so I let her cool off as I taxied back in to shut down. What do you think is wrong with her?"

"Well Sir, I know what is wrong."

If you can't diagnose the trouble, turn the page around, and read the answer (which you should have entered on the -13).

ANSWER: If you diagnosed a dead cylinder plus a third dead plug of any of the upper right or lower left plugs, you are correct. Did you overlook the fact that the idle mixture leanout at 750 rpm exceeded its 15 rpm increase tolerance — giving a too rich idle mixture which the crew-chief can adjust?